DATA EVALUATION RECORD

CYCLOPROPENE, 1-METHYL-
(AFxRD-038)

STUDY TYPE: Aquatic Invertebrate Acute Toxicity Test, Freshwater Daphnids (OPPTS 850.1010)

MRID 47024914

Prepared for
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U.S. Environmental Protection Agency
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Prepared by
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Task Order No. 07-042

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DATA EVALUATION RECORD

EPA Secondary Reviewer: Manying Xue, Chemist, 10/03/2007

STUDY TYPE:	Aquatic Invertebrate Acute Toxicity Test, Freshwater Daphnids (OPPTS 850.1010)
MRID NO:	47024914
DP BARCODE:	DP339928
DECISION NO:	373522
SUBMISSION NO:	Not provided
TEST MATERIAL:	AFxRD-038 (a.i., 3.8% 1-methylcyclopropene)
STUDY NO:	Wildlife International Ltd., Project No. 129A-184A
SPONSOR:	AgroFresh Inc., a Rohm and Haas Company, 100 Independence Mall, Philadelphia, PA 19106-2399
TESTING FACILITY:	Wildlife International, Ltd., 8598 Commerce Drive, Easton, MD 21601
TITLE OF REPORT:	1-Methylcyclopropene: A 48-Hour Static Acute Immobilization Test with the Cladoceran (*Daphnia magna*)
AUTHORS:	Drottar, K.R., T.Z. Kendall, and H.O. Krueger
STUDY COMPLETED:	September 26, 2001
CONFIDENTIALITY CLAIMS:	None
GOOD LABORATORY PRACTICE:	A signed and dated GLP statement was provided. The study was conducted in compliance with GLP standards with the following exception: stability, characterization, and verification of the test material identity and maintenance of records for the reference material were the responsibility of the study sponsor.
STUDY SUMMARY:	In a 48-hour static bioassay, *Daphnia magna* neonates received an aqueous exposure to 1-methylcyclopropene α-cyclodextrin complex (3.3% a.i.) at a mean measured concentration of 0.776 mg a.i./L. Control daphnids were exposed to dilution water only. No immobilization or adverse effects were observed in any of the treated or control daphnids after 24 hours. At 48 hours, one daphnid in the control group (3.3%) was dead, and one daphnid in the test material group (3.3%) was immobile. The 48-hour EC_{50} was >0.776 mg a.i./L, and the 48-hour no-mortality/immobility concentration and the no-observed-effect concentration were 0.776 mg/a.i./L.
CLASSIFICATION:	**Acceptable**.

Test Material

3.3% 1-Methylcyclopropene alpha cyclodextrin complex, Lot No. BAS 5-80, No. 00-103, a white powder supplied by the study sponsor with an expiration date of January 1, 2009. After receipt at the testing facility, the test material was stored under ambient conditions.

Test Methods

A 48-hour static test was conducted to determine the acute toxicity of the test material to *Daphnia magna*. The daphnids were obtained from in-house cultures maintained by the testing facility. Adult daphnids were cultured for 21 days prior to collection of the juveniles used in the test. The adults showed no sign of disease or stress during the culture period. The culture water was moderately-hard well water that was passed through a sand filter and pumped to a storage tank for aeration. Prior to use, the water was filtered to remove microorganisms and particles >0.45 µm. During culture, the daphnids were fed daily with a mixture of yeast, Cerophyll®, and trout chow, as well as a suspension of unicellular green algae (*Selenastrum capricornutum*).

During the four weeks immediately preceding the test, the specific conductance, hardness, alkalinity, and pH of the water were 315-325 µmhos/cm, 128-132 mg/L (as $CaCO_3$), 176-178 mg/L (as $CaCO_3$), and 8.1-8.2, respectively.

The test solutions were prepared by adding the test substance directly to dilution water. A four-liter amber glass bottle was filled with approximately four liters of water and 0.1072 g of the test material was added to provide a nominal concentration of 25 mg/L (0.822 mg a.i./L). The nominal concentration was selected based on calculations indicating that a 1000 ppm (v/v) headspace concentration was equivalent to an aqueous phase concentration of 0.822 mg a.i./L. The bottle was immediately capped, mixed for one hour, and the test solution was then poured into the test vessels.

The test material group consisted of three replicates of the test material treatment, and one surrogate treated vessel with no daphnia added. The negative control group consisted of three replicates of a test vessel containing dilution water only, and a surrogate vessel containing dilution water only. Neonate daphinds were obtained from three adults that had produced an average of at least three young per adult per day during the seven days preceding the test. The neonates were indiscriminately transferred to glass beakers of dilution water until each beaker contained 10 daphnids, then were transferred to the test vessels (10 daphnids/vessel). All transfers were made below the water surface using wide-bore pipettes. The test vessels were 500-mL glass bottles filled with approximately 500 mL of test solution. Each bottle was filled completely and sealed with a Teflon®-lined screw cap. The test vessels were randomly positioned in a temperature-controlled environmental chamber set at 20±1ºC. The photoperiod was 16 hrs light/8 hrs darkness, with a gradual transition. The daphnids were not fed during the test.

Water samples were collected from the surrogate bottle and one negative control bottle at test start, and from all the test vessels at test end. The samples were collected at mid-depth using a gas-tight syringe, and were analyzed for the active ingredient as soon as possible without storage. Analysis was by gas chromatography with flame ionization detection, using a method supplied by the study sponsor. The method parameters were supplied in Appendices 4.1 and 4.2 of MRID 47024914. The instrument was a Hewlett-Packard Model 5890 with a Varian CP-PoraBOND Q fused silica column (0.32 mm id x 10 m).

The daphnids were observed for immobility, mortality and abnormal behavior at 2.5, 24, and 48 hours after test start. Temperature, pH, and dissolved oxygen concentration were measured in the surrogate vessels at test start and in all test vessels at test end. Hardness, alkalinity, acidity, particulate matter, total organic carbon, and specific conductance were measured in the dilution water at test start.

The EC_{50} values, no-mortality/immobility concentration, and no-observable-effect concentration (NOEC) were estimated by visual interpretation of the mortality and clinical observation data.

Results Summary

All the test solutions appeared clear and colorless throughout the test. Water temperatures ranged from 20.4 to 21.0ºC, and dissolved oxygen was ≥89% of saturation. The water pH ranged from 8.5 to 8.7. Hardness, alkalinity, acidity, specific conductance, particulate matter, and total organic carbon in the dilution water at test initiation were typical of the test facility well water.

The measured concentration of 1-methylcyclopropene in the test material solutions ranged from 0.738 to 0.861 mg/L (91.4 to 104.8% of nominal), with a mean of 0.766 mg/L. No immobilization or adverse effects were observed in any of the treated or control daphnids after 24 hours. At 48 hours, one daphnid in the control group (3.3%) was dead, and one daphnid in the test material group (3.3%) was immobile. The 48-hour EC_{50} was >0.776 mg a.i./L, and the NOEC was 0.776 mg/a.i./L.

Study Authors' Conclusions

The study authors concluded that the 48-hour EC_{50} was >0.776 mg a.i./L, and that the 48-hour no-mortality/immobility concentration and the NOEC were 0.776 mg/a.i./L.

Reviewer's Conclusion

The reviewer agrees with the study authors' conclusions. No carrier control was used in the test. The reviewer notes that the concentration of active ingredient (3.3%) in the test material used in the test was slightly lower than that listed on the product label (3.8%).